CLAIMS

I claim:

1. A system for separating fluid-borne material from a fluid that carries particulate matter along with the material, comprising:

a screen arrangement including a support and a screen suspended from the support, wherein the screen defines an interior and an outlet, and is constructed of a flexible and pliable screen material formed of a series of interwoven strands that define drainage passages;

a fluid supply arrangement configured to direct the fluid outwardly from within the interior of the screen onto the inner surface of the screen, wherein the fluid impinges on the inner surface of the screen at one or more impingement locations, and wherein the screen is configured to deflect outwardly at the one or more impingement locations, wherein the drainage passages are sized to retain the material on an inner surface defined by the screen and to allow the particulate matter to pass through the drainage passages; and

means interconnected with the support for imparting movement to the screen, wherein movement of the screen varies the one or more impingement locations while the fluid is directed outwardly onto the inside surface of the screen by the fluid supply arrangement;

wherein the outward deflection of the screen upon movement of the screen past the one or more impingement locations functions to vary the configuration of the drainage passages to dislodge any particulate matter located within the drainage passages, and wherein pressure applied by the fluid supply arrangement at the one or more impingement locations functions to force the particulate matter located within the drainage passages through the drainage passages so as to prevent buildup of particulate matter within the drainage passages.

2. The system of claim 1, wherein the support comprises a frame arrangement, wherein the frame arrangement is interconnected with an upper end defined by the screen and wherein the screen defines a lower area located below the frame arrangement that is unsupported.

3. The system of claim 2, wherein the screen defines a conical configuration having an upper end connected to the frame arrangement and a lower end defining the outlet.

4. The system of claim 3, wherein the means for imparting movement to the screen comprises means for rotating the frame arrangement about a generally upright axis of rotation coincident with a longitudinal axis defined by the screen.

5. The system of claim 4, wherein the fluid supply arrangement comprises a conduit arrangement located within the interior defined by the screen, wherein the conduit arrangement includes a series of openings through which the fluid is applied to the inside surface of the screen.

6. The system of claim 5, wherein the openings in the conduit arrangement are configured and arranged to apply a force to the inside surface of the screen tending to impart rotation to the screen about the axis of rotation of the frame arrangement.

7. The system of claim 2, wherein the frame arrangement and the screen are configured such that the screen is suspended from the frame and defines an upwardly open trough having an open end defining the outlet of the screen.

8. The system of claim 7, wherein the means for imparting movement to the screen comprises means for varying the location at which the fluid is directed onto the screen.

9. The system of claim 8, wherein the fluid supply arrangement includes a conduit having an end through which the fluid is discharged, and further comprising a discharge member interconnected with the end of the conduit for varying the flow of the fluid and the location at which the fluid strikes the screen.

10. The system of claim 7, wherein the means for imparting movement to the screen comprises means for moving the frame arrangement so as to impart movement to the screen as the fluid is directed onto the surface of the screen.

11. The system of claim 10, wherein the means for imparting movement to the screen is operable to move the screen in a direction transverse to a longitudinal axis defined by the trough, wherein transverse movement of the screen is operable to roll the material in the trough.

12. The system of claim 11, wherein the frame arrangement and the screen are configured such that the trough defines a downwardly angled lower surface leading toward the outlet, to assist in directing the material toward the outlet upon movement of the screen.

13. The system of claim 11, wherein the screen is movable in an axial direction along a longitudinal axis defined by the trough.

14. The system of claim 13, wherein the frame arrangement and the screen are configured such that the trough defines a downwardly angled lower surface leading toward the outlet, to assist in directing the usable fibers toward the open end upon movement of the screen.

15. A method of separating fluid-borne material from a fluid that carries particulate matter along with the material, comprising the steps of:

directing the fluid onto a surface of a flexible screen, wherein the screen defines drainage passages sized to retain the material on the surface of the screen and wherein the drainage passages allow fluid and particulate matter contained within the fluid to pass through the screen, wherein the screen is supported by a support arrangement that is configured to provide outward deflection of the screen where the fluid is directed onto the surface of the screen; and

causing movement of the screen while directing the fluid onto the surface of the screen so as to vary the location at which the fluid is directed onto the surface of the screen, wherein the movement of the screen combined with the outward deflection of the screen is operable to alter the configuration of the drainage passages of the screen to dislodge particulate matter contained within the drainage passages, wherein pressure applied to the surface of the screen by the fluid is operable to force particulate matter contained within the drainage passages through the drainage passages to prevent buildup of particulate matter within the screen passages.

16. The method of claim 15, further comprising the step of collecting the material from a discharge area defined by the screen.

17. The method of claim 16, wherein the step of causing movement of the flexible screen is carried out by varying the location at which the papermaking fluid is directed onto the surface of the screen.

18. The method of claim 17, wherein the step of varying the location at which the fluid is directed onto the surface of the screen is carried out by discharging the fluid through a pliable discharge member interconnected with a rigid conduit, wherein the pliable discharge member defines an outlet which is movable in response to the discharge of fluid therethrough.

19. The method of claim 16, wherein the step of causing movement of the flexible screen is carried out by imparting movement to the screen through a frame arrangement from which the screen is suspended.

20. The method of claim 19, wherein the screen is configured to define a conical shape having an open lower end defining the discharge area of the screen and wherein the frame arrangement is located at an upper end defined by the screen, and wherein the step of directing the fluid onto the surface of the screen is carried out by directing the fluid outwardly toward an inner surface defined by the screen from a location within an interior defined by the screen.

21. The method of claim 20, wherein the step of imparting movement to the screen is carried out by rotating the frame arrangement while the fluid is directed onto the inner surface of the screen.

22. The method of claim 21, wherein the step of imparting rotation to the screen is carried out by directing the fluid tangentially against the inner surface of the screen.

23. The method of claim 19, wherein the screen is suspended from the frame arrangement and wherein the screen and the frame arrangement are configured such that the screen defines a trough configuration having an open end defining the discharge area of the screen, and wherein the step of directing the fluid onto the surface of the screen is carried out by applying the fluid to side areas defined by the trough configuration of the screen.

24. The method of claim 23, wherein the step of imparting movement to the screen is carried out by moving the frame arrangement transversely relative to the longitudinal axis defined by the trough of the screen.

25. The method of claim 24, further comprising the step of orienting the screen so that the trough of the screen defines a downwardly angled lower wall leading to the open end of the screen, for assisting and directing the material to the discharge area of the screen.

26. The method of claim 23, wherein the step of imparting movement to the screen is carried out by moving the frame arrangement in an axial direction relative to a longitudinal axis defined by the trough of the screen.

27. The method of claim 26, further comprising the step of orienting the screen so that the trough of the screen defines a downwardly angled lower wall leading to the open end of the screen, for assisting in directing material to the discharge area of the screen.

28. A fiber recovery system for use in recovering usable fibers contained in papermaking fluid, comprising:

flexible screen means defining openings sized to prevent the passage of usable fibers therethrough, the flexible screen means defining a discharge area;

fluid supply means for directing fluid onto a surface of the flexible screen means, wherein the flexibility of the screen means is operable to prevent the build up of fine particles contained in the fluid within the openings of the screen means, and wherein the screen means functions to retain usable fibers on the surface of the screen means; and

means for directing usable fibers on the surface of the screen means toward the discharge area of the screen means, to enable the usable fibers to be discharged from the screen means for recirculation into a papermaking process.